



NEVADA DIVISION OF
WATER RESOURCES



Nevada Department of
**CONSERVATION &
NATURAL RESOURCES**

Mason & Smith Valleys

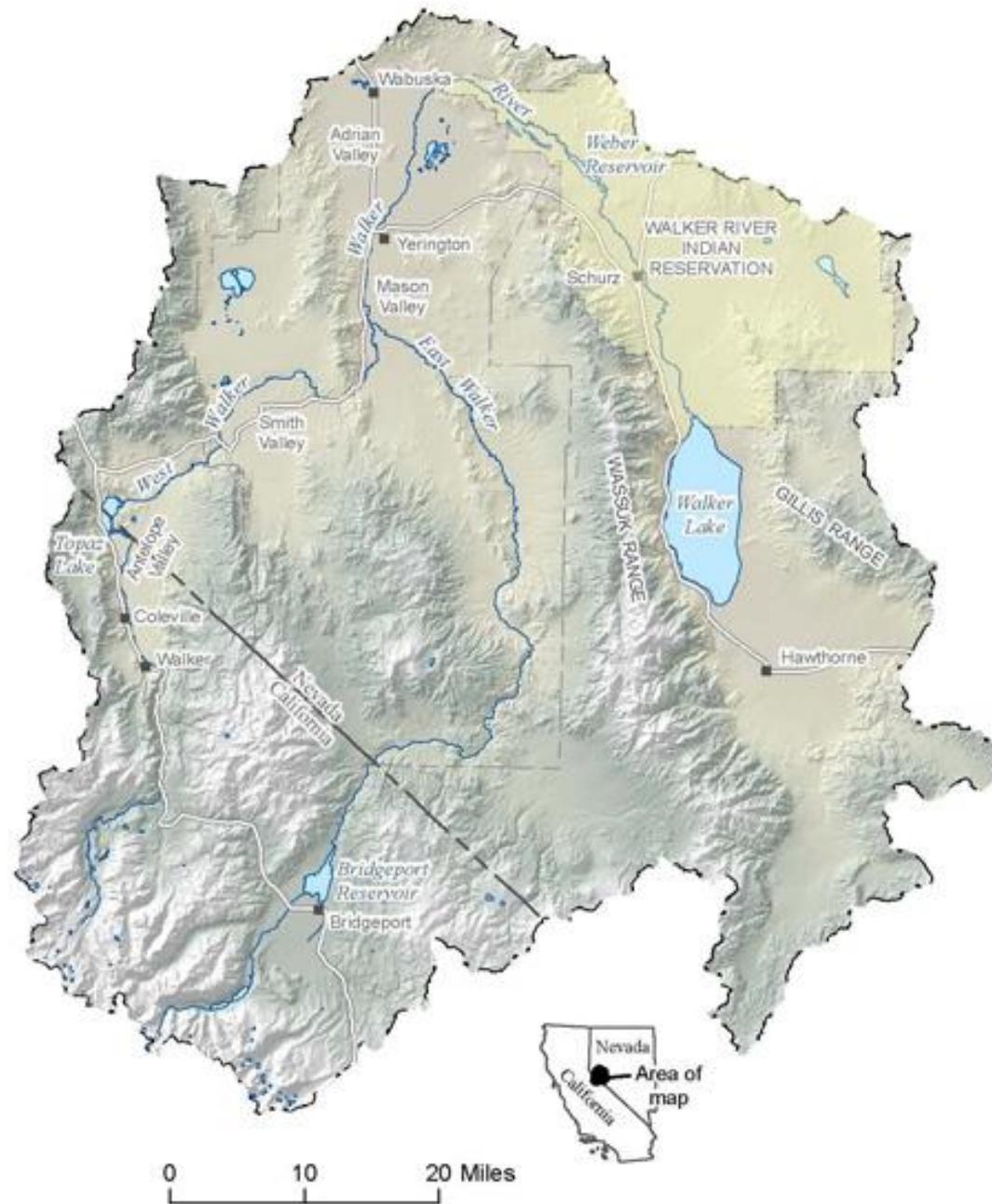
2022 Recap: Pumping and Groundwater Conditions

December 15, 2022

Presented by:

**Wyatt Fereday, Kip Allander, & AJ
Jensby**

Nevada Division of Water Resources



OVERVIEW

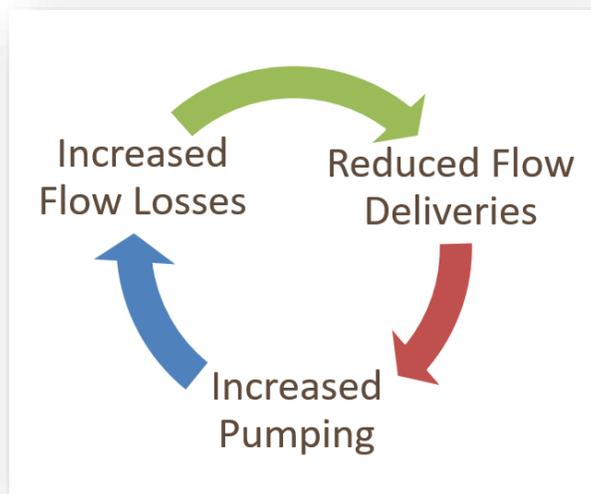
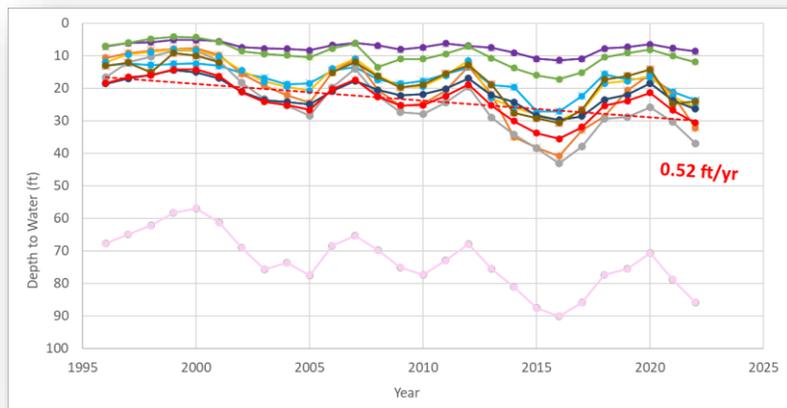
- Review – Why are we here today?
- Current Water Supply conditions
- Mason and Smith Valleys 2022 pumping review
- Establishing Seasonal Pumping goals – experimental



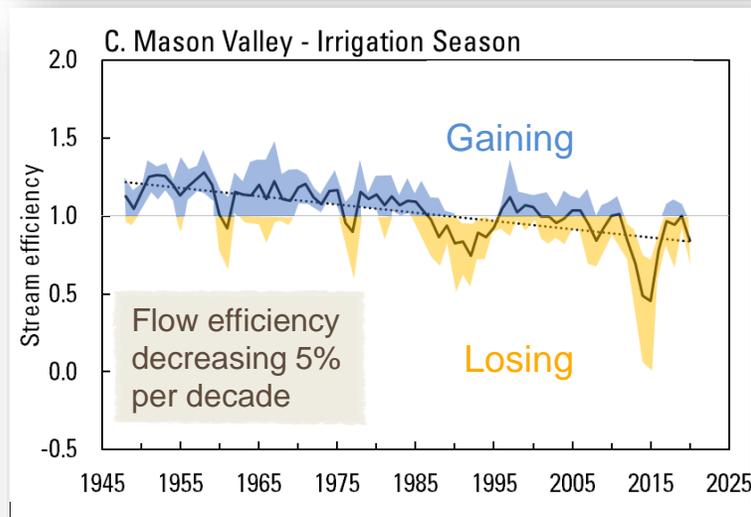
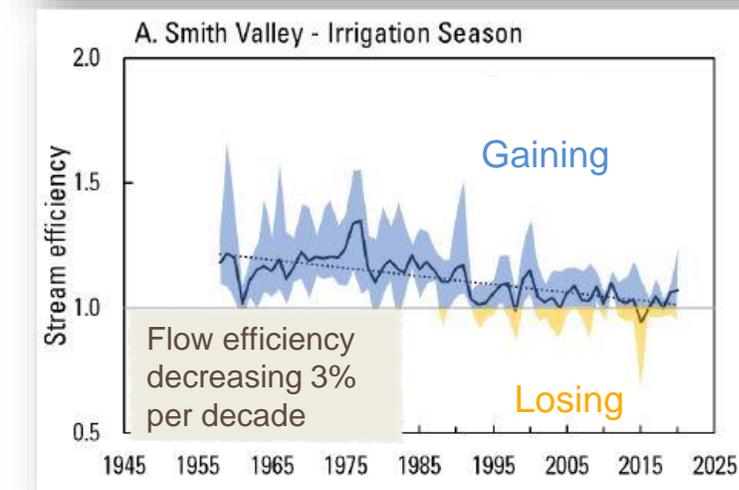
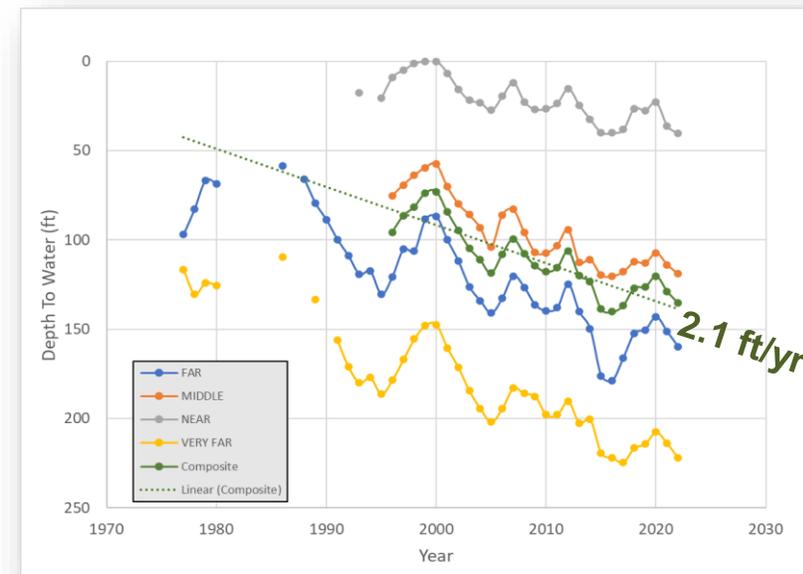
REVIEW – WHY WE ARE HERE TODAY?

MASON AND SMITH VALLEY WATER SUPPLIES ARE NOT ON A SUSTAINABLE TRAJECTORY

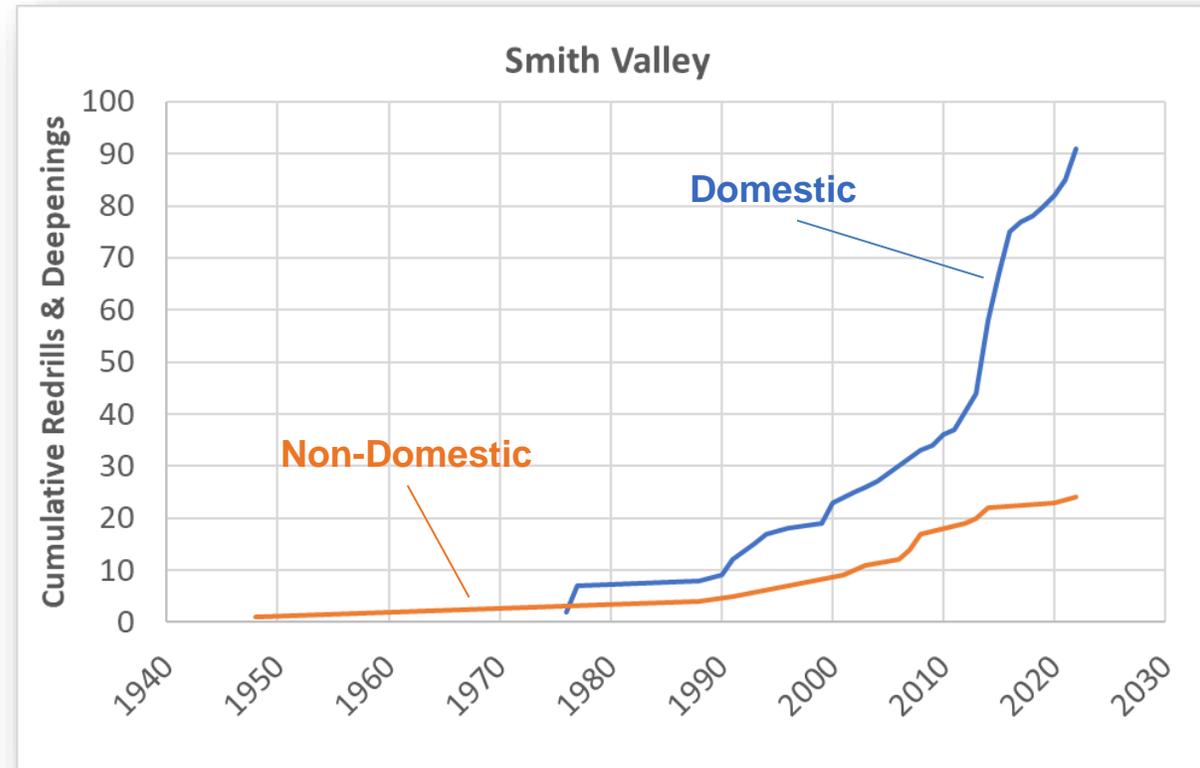
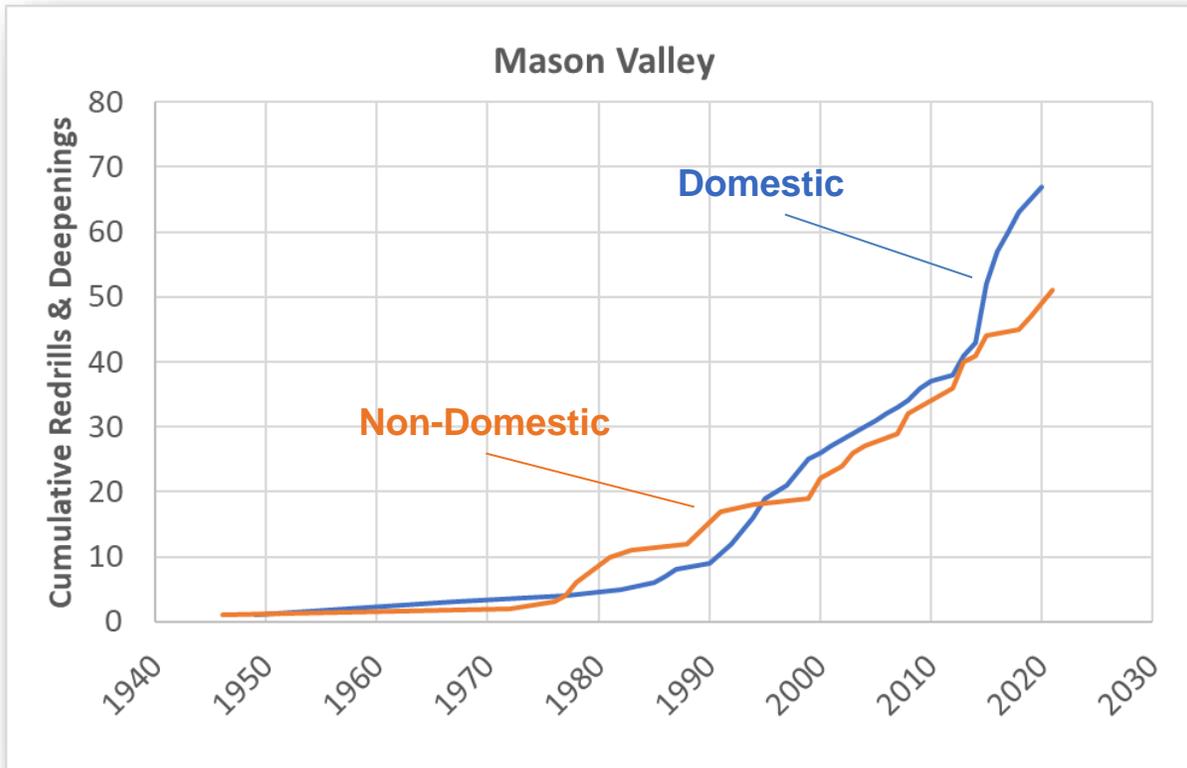
Mason Valley



Smith Valley



REDRILLED & DEEPENED WELLS

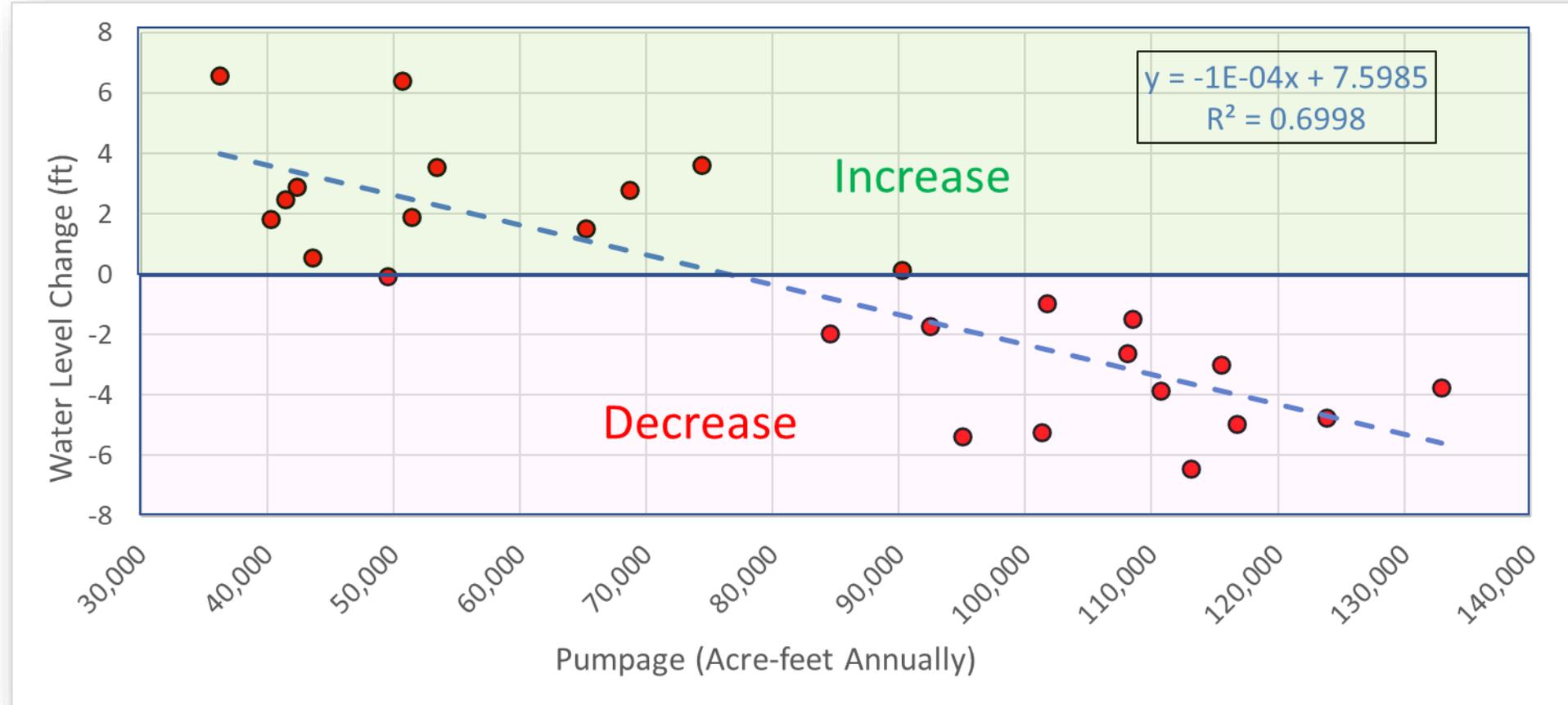


MASON VALLEY ANNUAL PUMPING VS. WATER LEVEL CHANGE

1996-21 average:
81,256 AF

Estimated Goal:
76,000 AF

Pumping Reduction
Goal is $\geq 5,250$
AF/year



Break-even point is years with streamflow of about 280,000 AF (96-21 avg. = 246,000 AF)

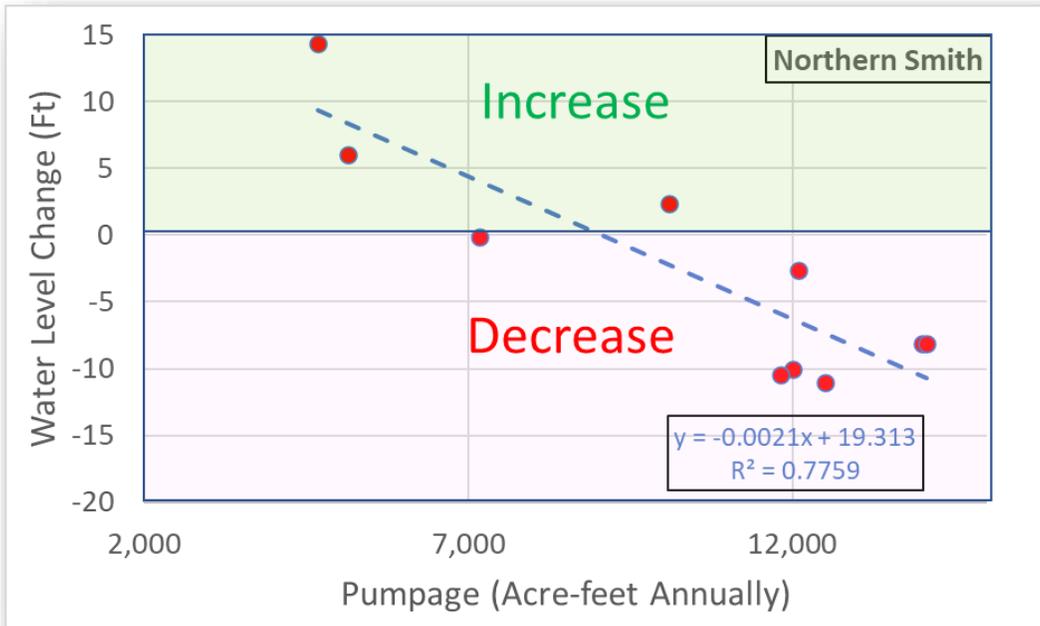
SMITH VALLEY ANNUAL PUMPING VS. WATER LEVEL CHANGE

Northern Smith Pumping*

2012-21 Average: 10,360 AF

Estimated goal: <9,200 AF

Pumpage reduction goal $\geq 1,200$ AF/yr

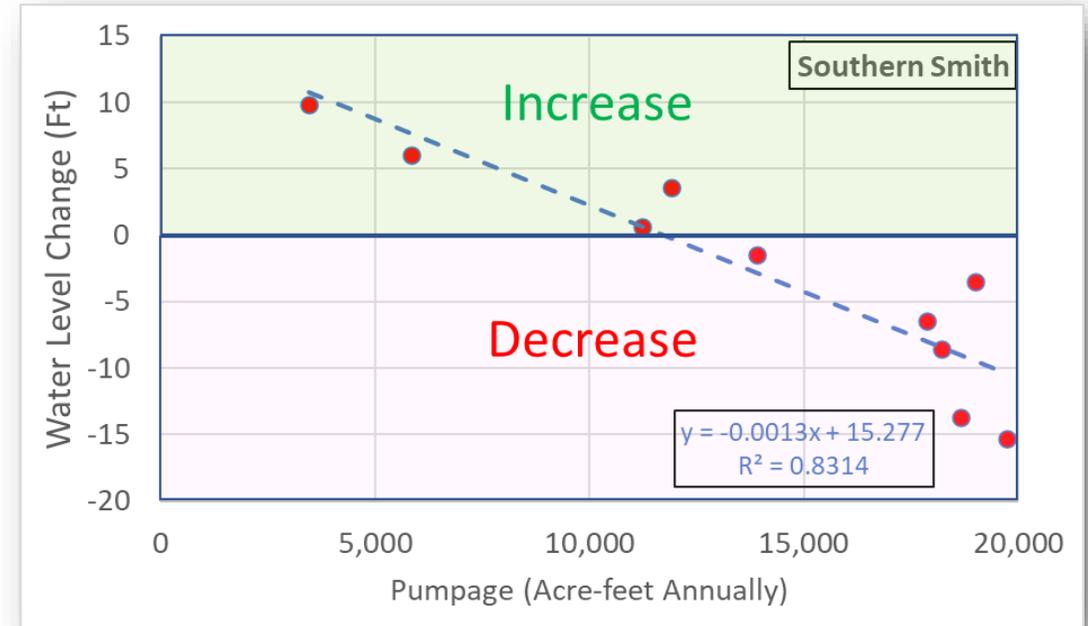


Southern Smith Pumping

2012-21 Average: 13,980 AF

Estimated goal: <11,800 AF

Pumpage reduction goal $\geq 2,200$ AF/yr



*Excludes Artesia

Total pumping reduction goal $\geq 3,400$ AF/yr

Break even point is years with streamflow of about 220,000 AF (07-21 avg. = 155,000 AF)

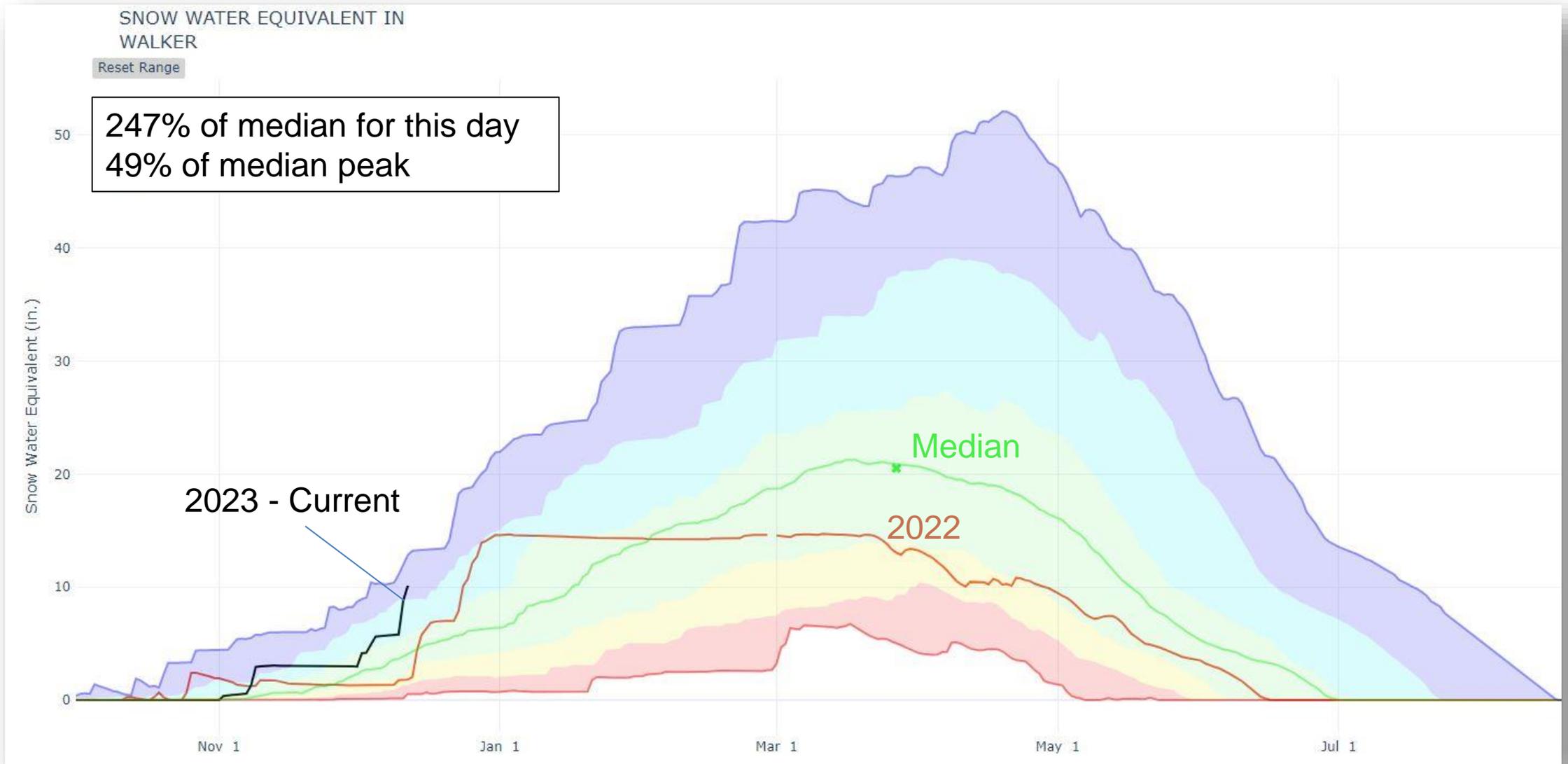
OPTIONS FOR REDUCING GROUNDWATER PUMPING IN SMITH AND MASON VALLEY

1. Voluntary reductions in pumping while water users develop sustainable use plan.
2. Establish Critical Management Areas.
3. Curtailment by Priority.

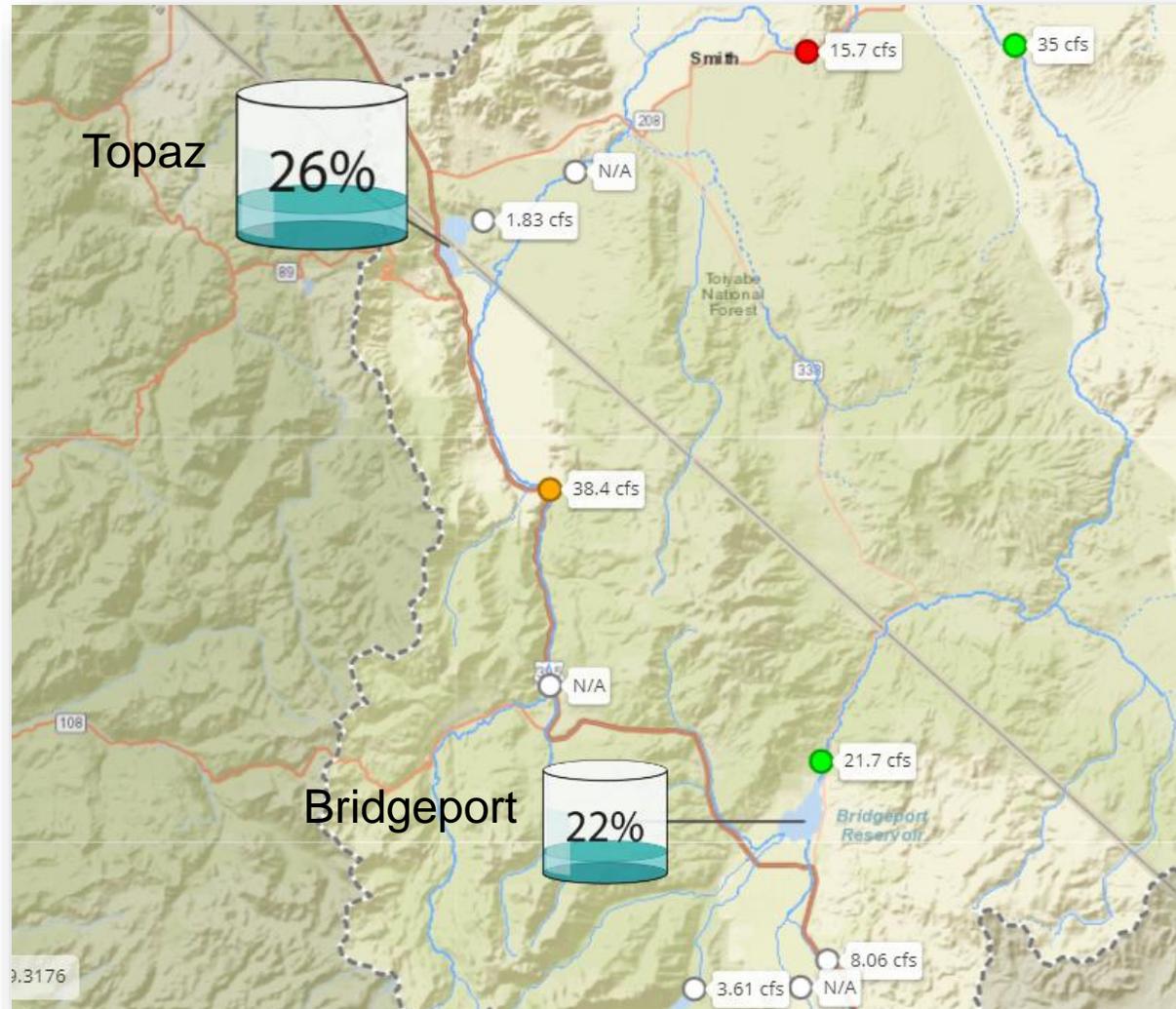


CURRENT WATER SUPPLY CONDITIONS

2023 WALKER SNOW WATER EQUIVALENT



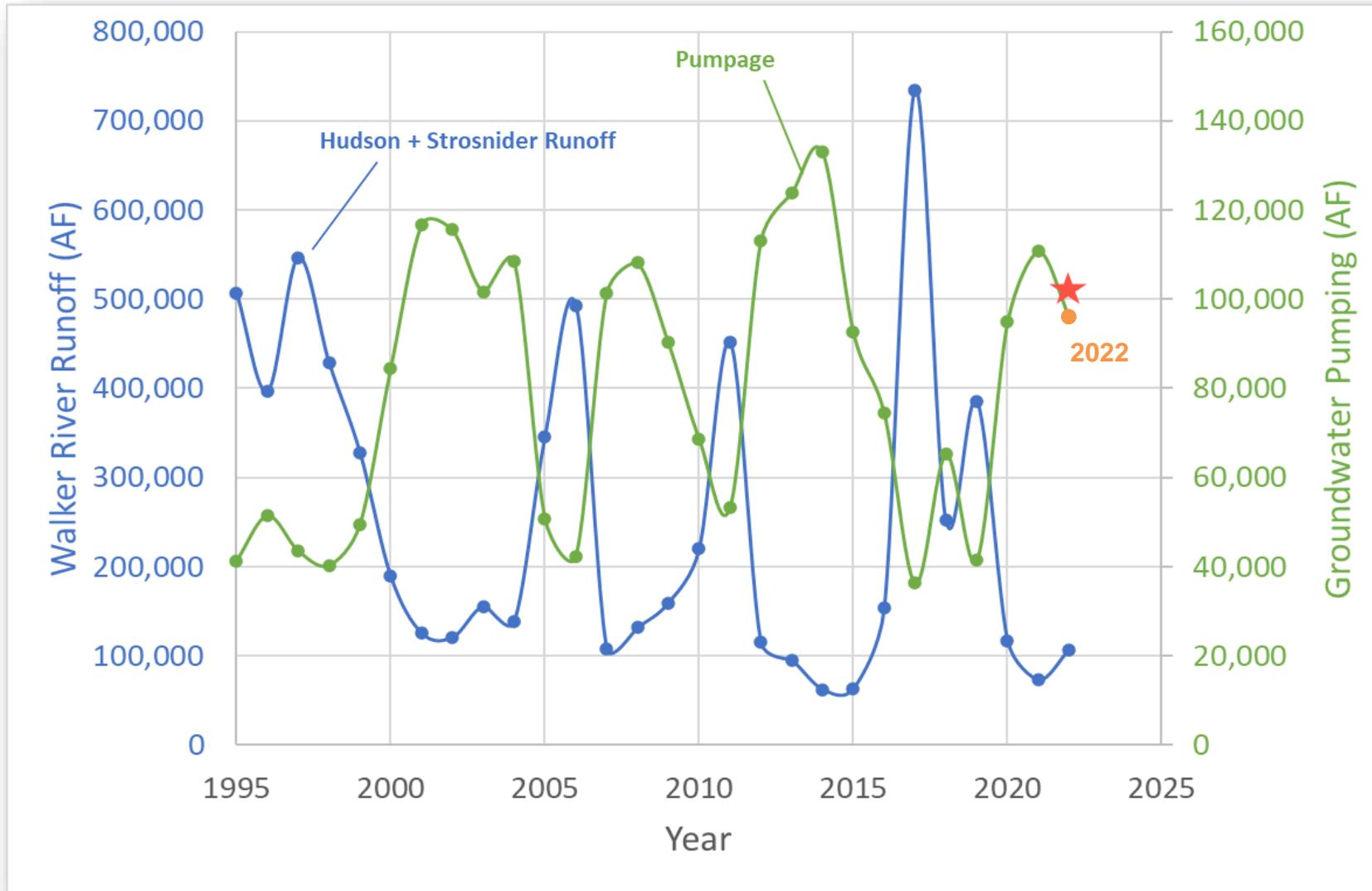
CURRENT RESERVOIR LEVELS (12/13/2022)



<https://webapps.usgs.gov/walkerbasinhydromapper/#viewer>

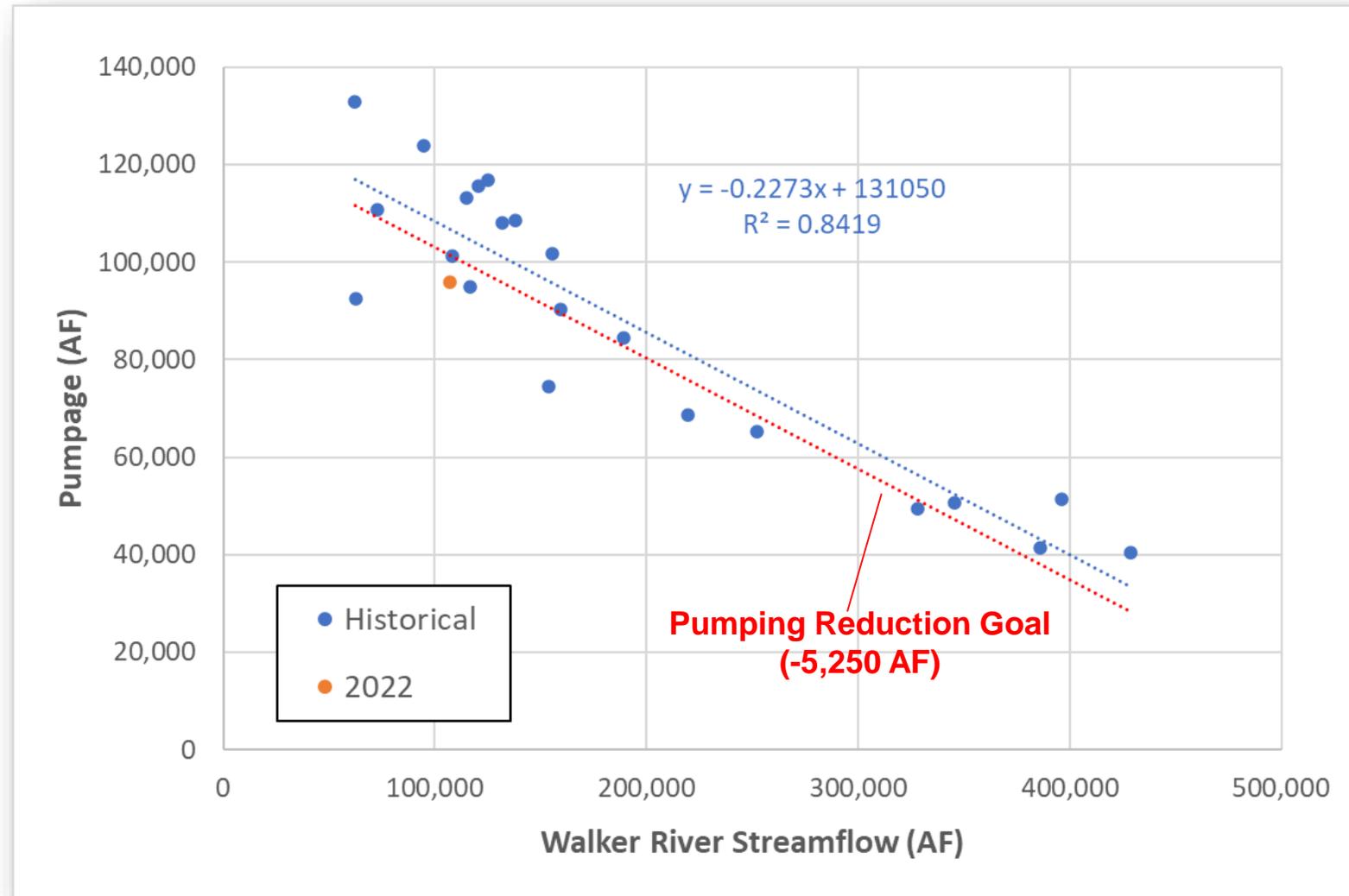
2022 GROUNDWATER PUMPING REVIEW

WALKER RIVER STREAMFLOW VS. MASON VALLEY PUMPING



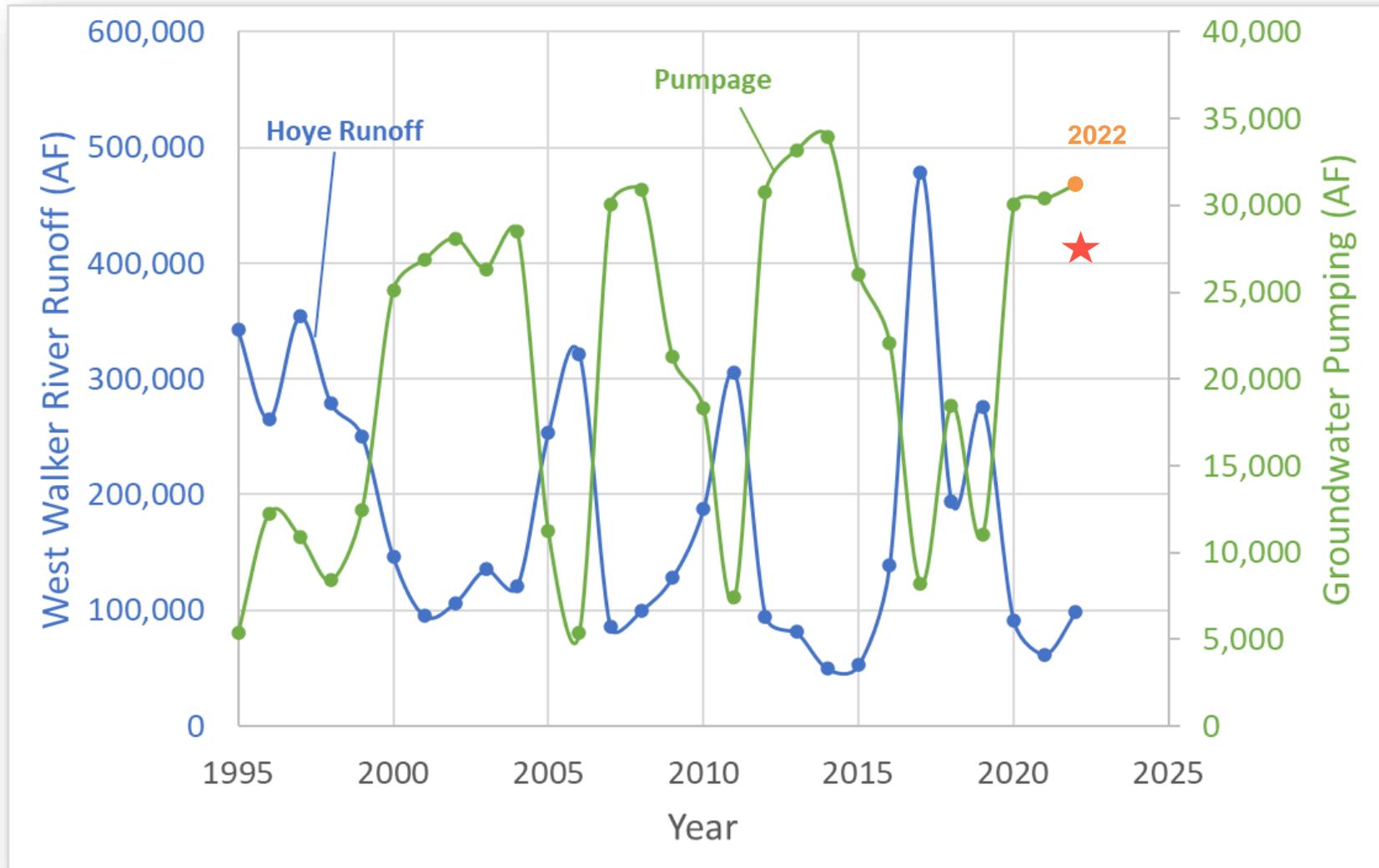
★ Anticipated pumping for 2022

WALKER RIVER STREAMFLOW* vs. MASON VALLEY PUMPAGE



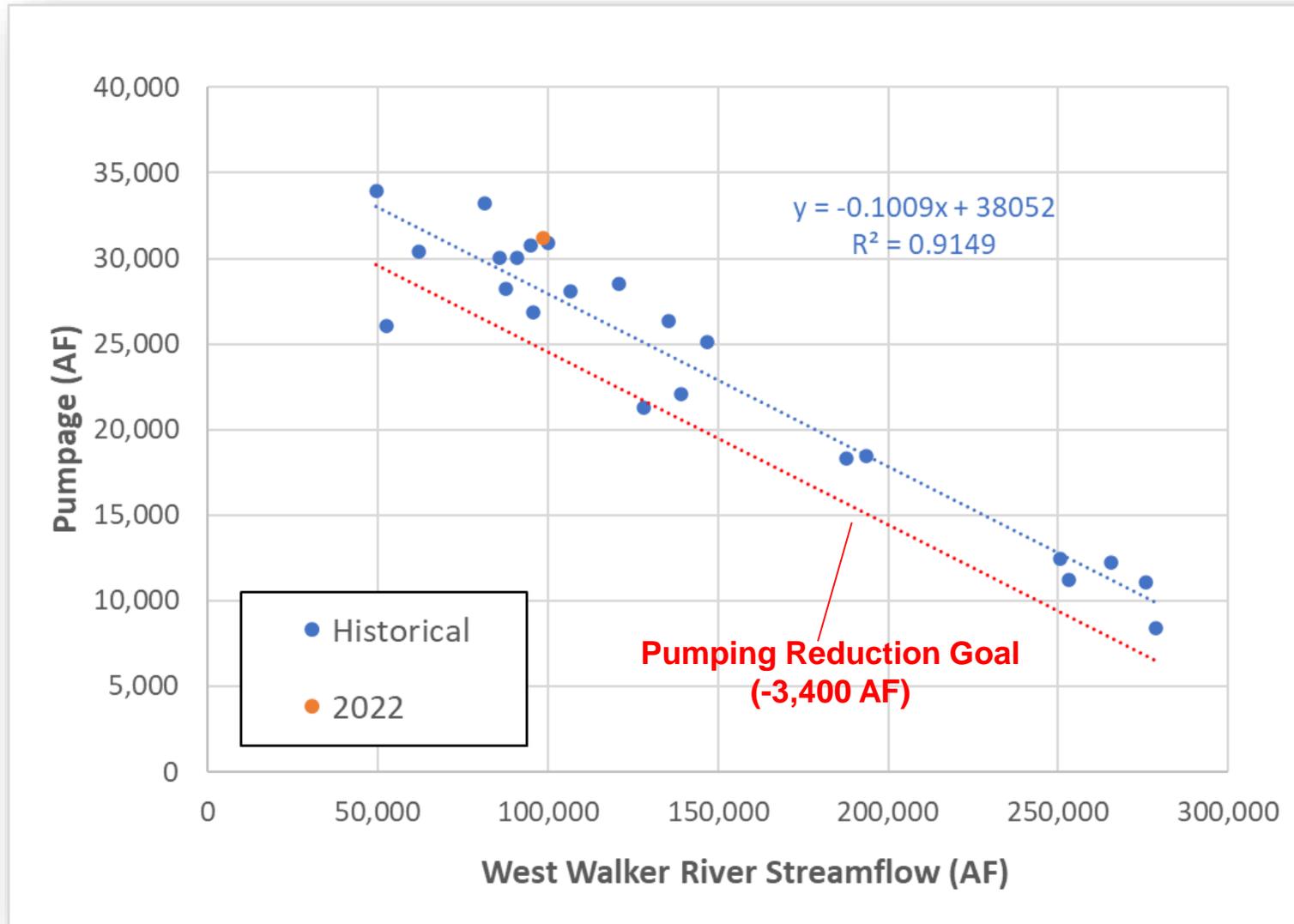
*Top 5 wettest years have been removed from regression

WEST WALKER RIVER STREAMFLOW VS. SMITH VALLEY PUMPING*



★ Anticipated pumping for 2022

WEST WALKER STREAMFLOW* vs. SMITH VALLEY PUMPING



*Top 5 wettest years have been removed from regression

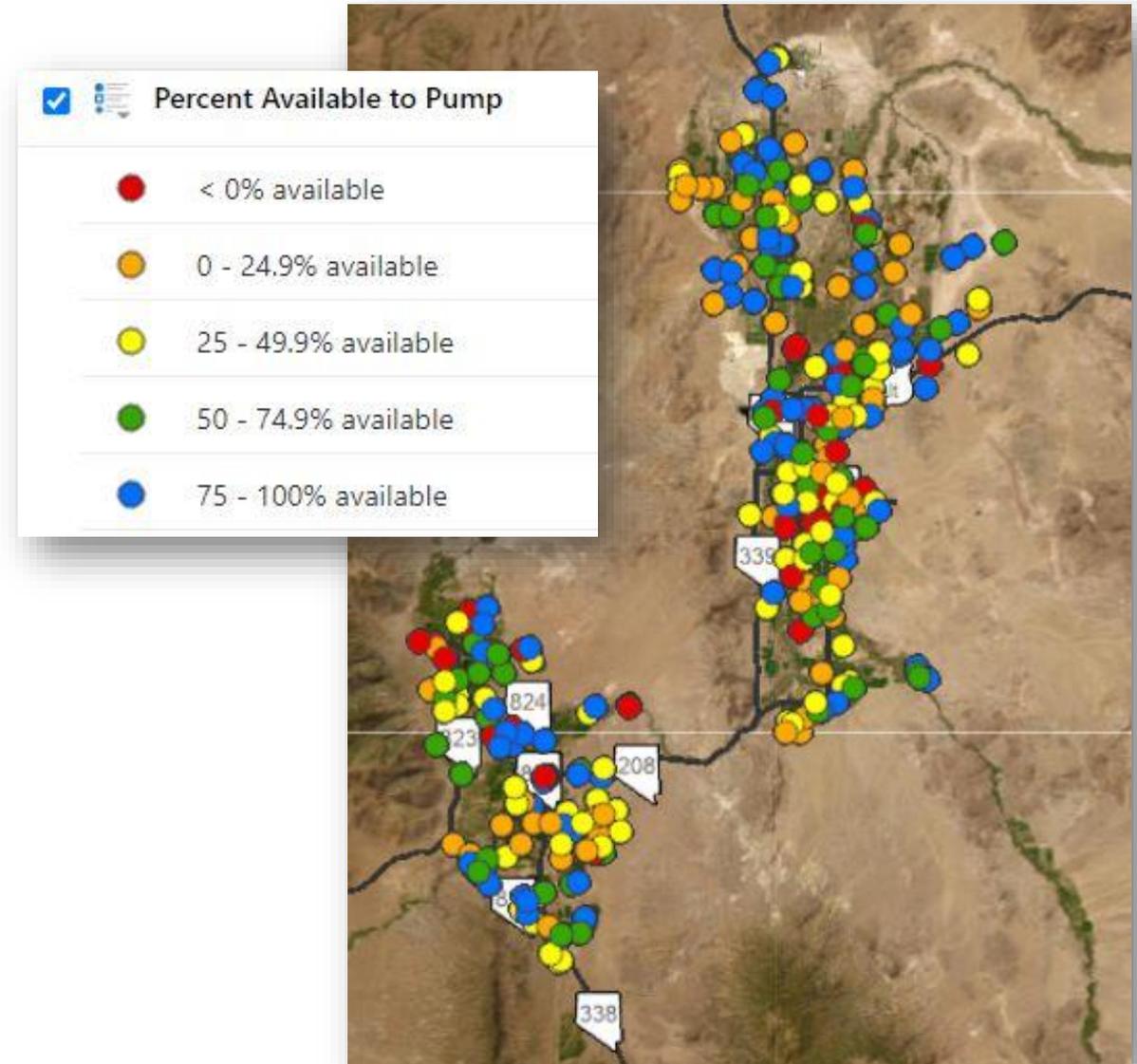
MASON / SMITH PUMPAGE MAP

As of Dec 7, 2022

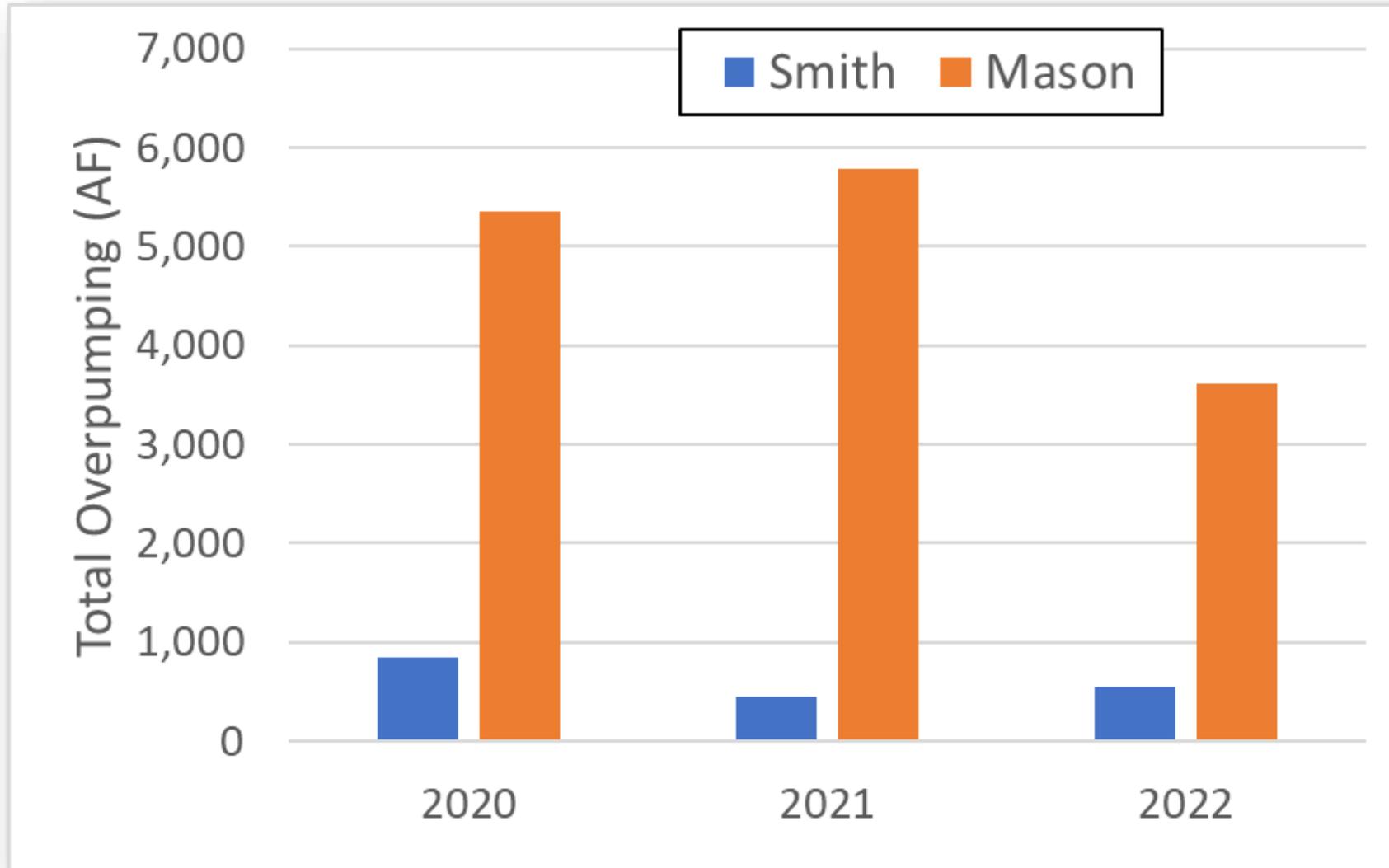
- Wells color-coded by % of duty remaining to pump for the year
- Tables list historical annual pumpage
- Linked to the online Meters Database*

water.nv.gov -> Mapping & Data -> Mapping Application Links -> [Mason and Smith Valley Groundwater Pumping Availability](#)

*All water users > 5AF must report monthly meter readings at: meters.water.nv.gov



OVERPUMPING PERMITTED DUTIES



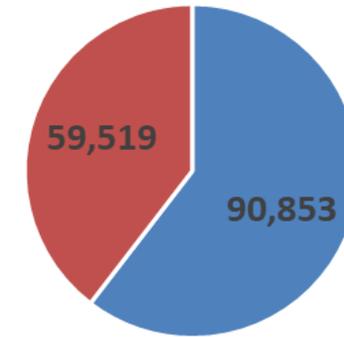
PRIMARY VS. SUPPLEMENTAL RIGHTS

Supplemental Groundwater Rights are *“limited to the extent necessary to make up a portion of 4.0 acre-feet per acre when combined with the entitled Decree and storage water during any given year.”*

In other words, supplemental GW can only make up shortfalls in surface water availability and cannot replace surface water use.

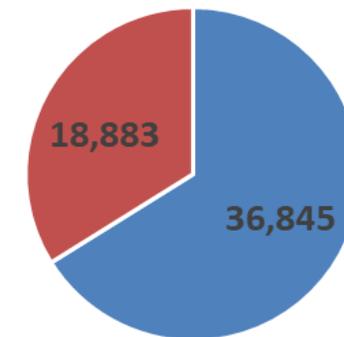
Use of supplemental GW while decree water is in priority is in violation of the permit terms and contributes toward depletion of the groundwater supply.

Mason Valley Groundwater Rights (acre-feet)



■ Supplemental ■ Primary

Smith Valley Groundwater Rights (acre-feet)



■ Supplemental ■ Primary

WATER LEVEL DASHBOARD

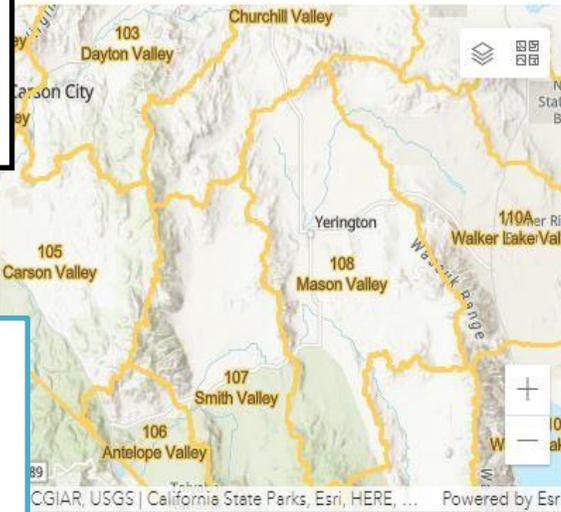
Water level data can be accessed and downloaded at <http://water.nv.gov/WaterLevelData.aspx>.

Created and maintained by

water.nv.gov -> Mapping & Data
-> Mapping Application Links ->
[NDWR Water Level Dashboard](#)

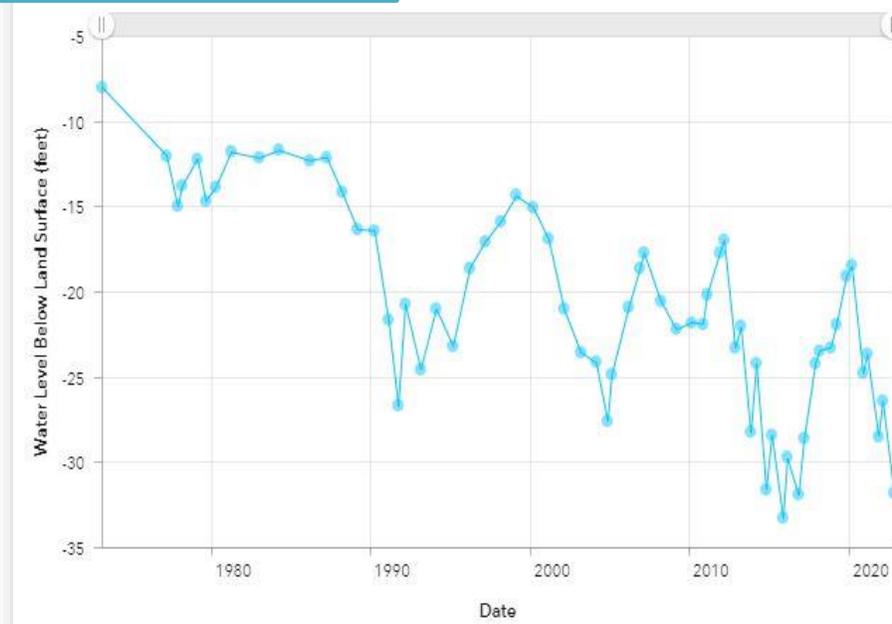
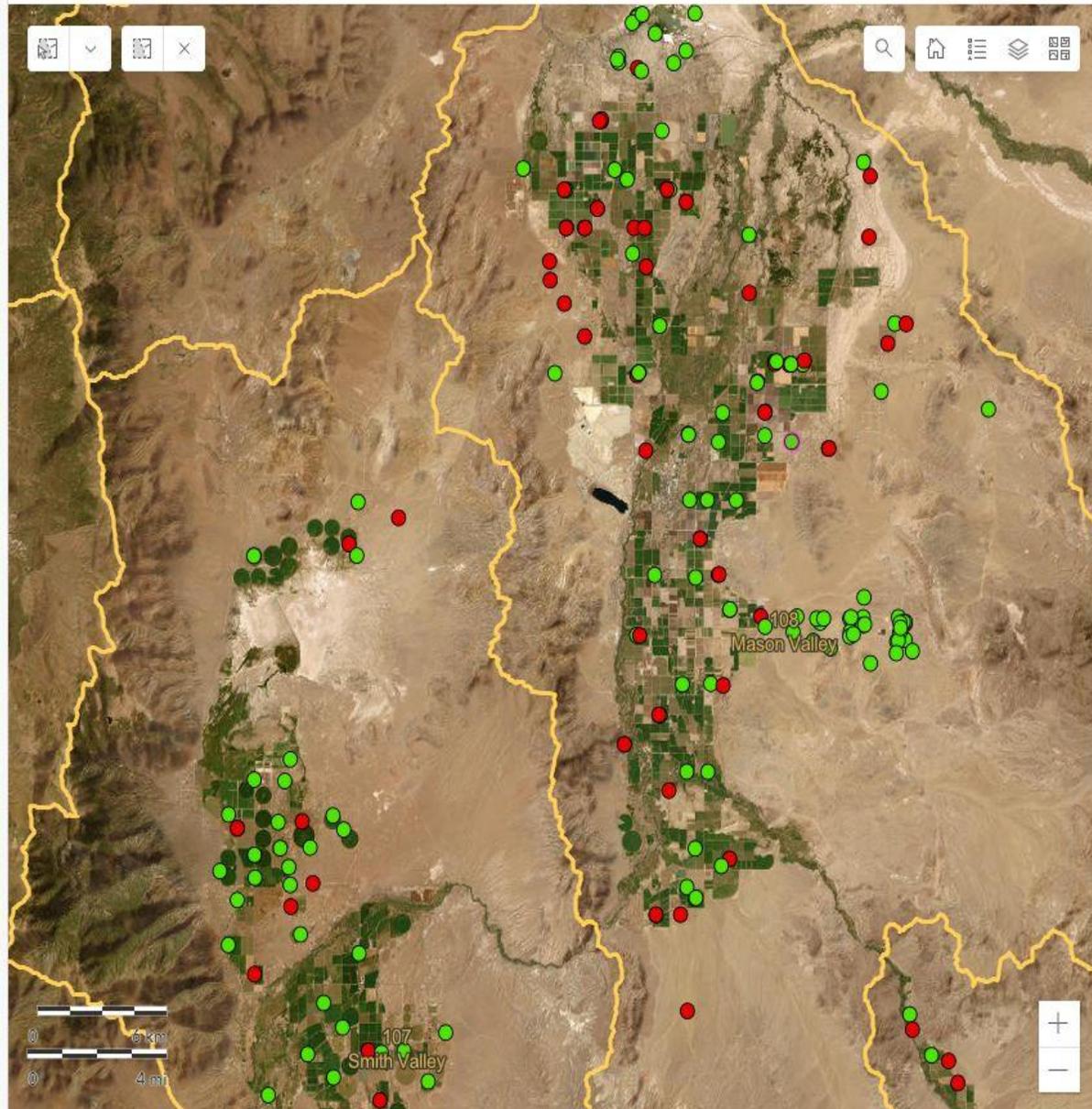
Basin Map Shaded by Hydrographic Region

(Automatically zooms to location of main map)



Water Level Measurement Sites

Pick an option in the dropdown below to select well sites and graph the associated water levels.



Note: Outlying data points may indicate a data entry error.

Earthstar Geographics | Office of the State Engineer, Nevada Division of Water Resources, Department of Conservation and Natural Resources | Powered by Esri

Tip: Zoom in to see sites names. Click on a single well for attributes (you may need to click the right arrow in the pop-up box).

ESTABLISHING SEASONAL PUMPING GOALS

ESTABLISHING SEASONAL PUMPING GOALS – EXPERIMENTAL

- Problem: Knowing how much to pump, or not to pump, in advance of an irrigation season.
- Like forecasting weather and runoff, tricky with lots of uncertainty.
- But needed so irrigators can better plan the season.

- Work in progress
- SWE (snow-water equivalent) and Reservoir storage seem like they should be the best information available for making these ‘predictions.’



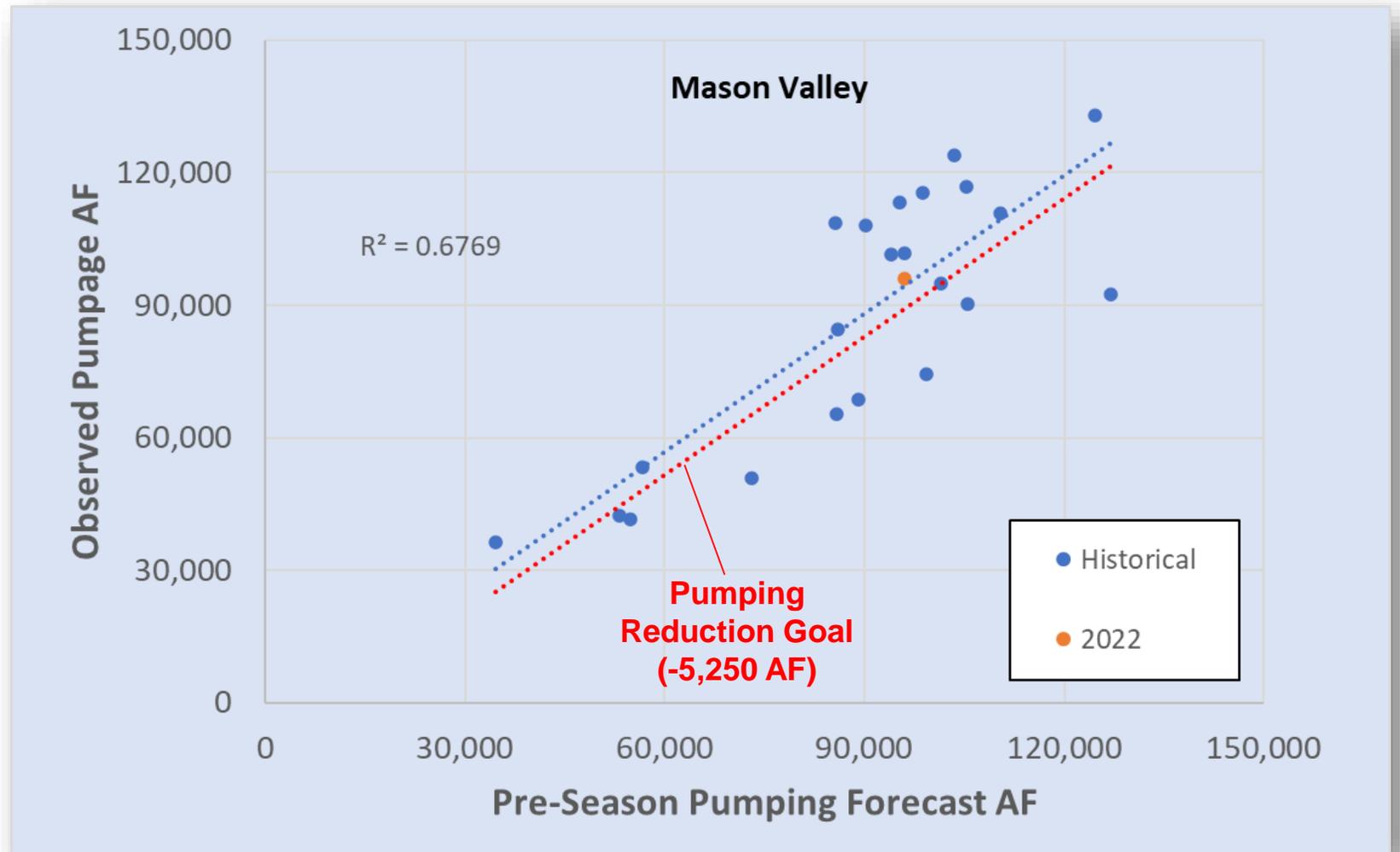
SEASONAL PUMPING GOAL: MASON VALLEY 2022

$$\text{Pre-Season Pumping Forecast} = -1.03 \cdot (0.55\text{BP} + 0.45\text{TP}) - 37,198 \cdot \text{SWE} + 150,310 - 5,250$$

Based on Mar 1 Observations each year

BP = Bridgeport Storage
TP = Topaz Storage
SWE = Walker Basin
Snow Water Equivalent

≥5,250 AF is pumping reduction goal



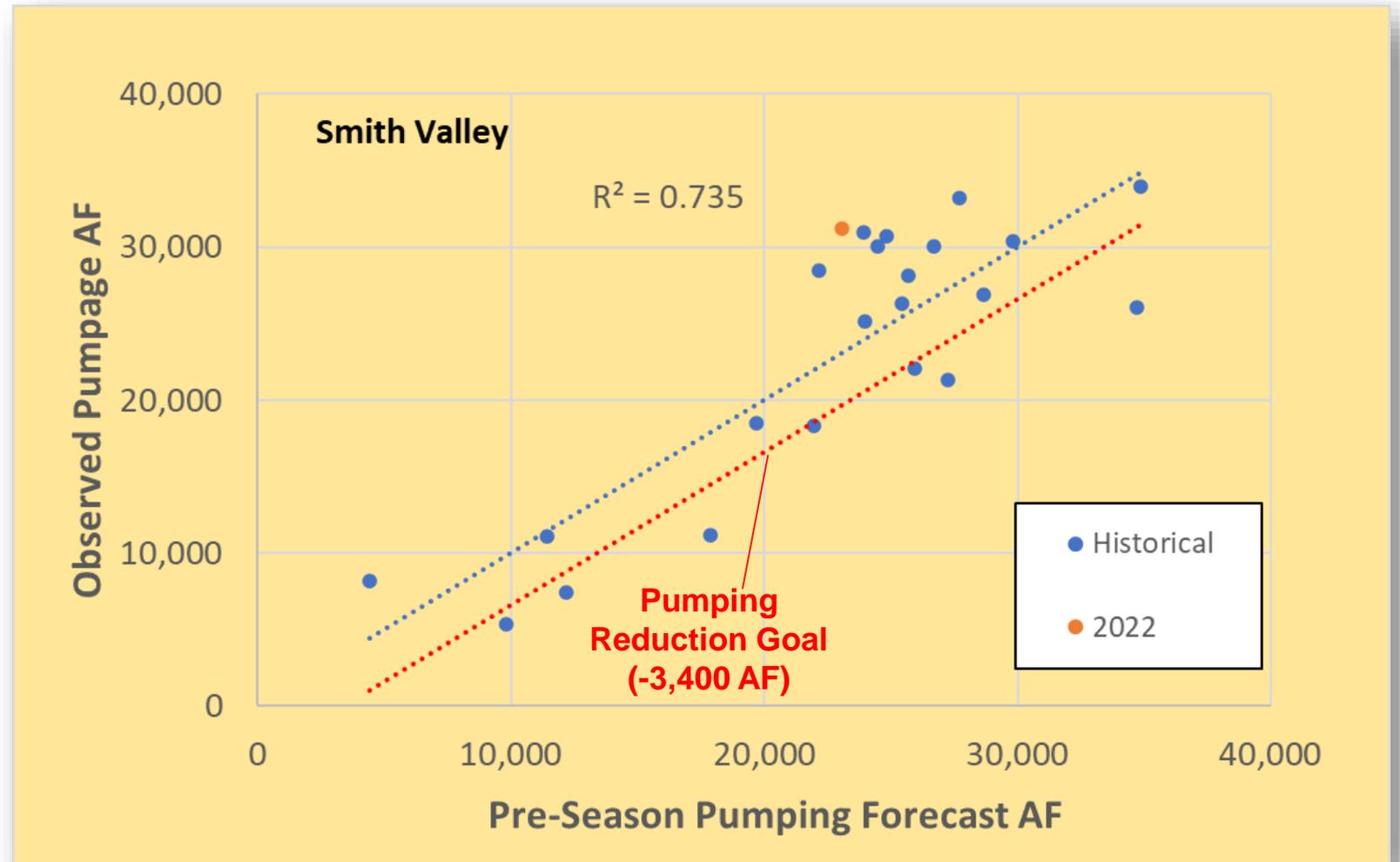
PUMPING PREDICTION: SMITH VALLEY 2022

$$\text{Pre-Season Pumping Forecast} = -0.312*(TP) - 11,884*(SWE) + 42,524 - 3,400$$

Based on Mar 1 Observations
each year

TP = Topaz Storage
SWE = West Walker Basin
Snow Water Equivalent

$\geq 3,400$ AF is pumping reduction goal



SUMMARY AND FUTURE OUTLOOK

- Less pumping in Mason, and slightly more in Smith, in 2022 than in 2021
- Groundwater levels at or near all-time lows
- Further voluntary pumping reductions needed
 - Supplemental groundwater used only when decree/storage not available
 - Prioritize surface before groundwater use, especially in wet years
 - Fewer irrigated acres or cuttings in dry years, especially successive dry years?
 - Different crop types?
- Comparison of annual pumping totals with spring water level change can help refine estimate of safe system yield
- March 1 snowpack & reservoir storage may help establish seasonal pumping targets
- Water level and pumpage established and ongoing in East Walker. East Walker Designation is in the queue.



Questions?



Contact

Division of Water Resources

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water.nv.gov